

DEVICES AND METHODS FOR PORT-ACCESS MULTIVESSEL
CORONARY ARTERY BYPASS SURGERY

ABSTRACT OF THE DISCLOSURE

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Surgical methods and instruments are disclosed for performing port-access or closed-chest coronary artery bypass (CABG) surgery in multivessel coronary artery disease. In contrast to standard open-chest CABG surgery, which requires a median sternotomy or other gross thoracotomy to expose the patient's heart, port-access CABG surgery is performed through small incisions or access ports made through the intercostal spaces between the patient's ribs, resulting in greatly reduced pain and morbidity to the patient. In situ arterial bypass grafts, such as the internal mammary arteries and/or the right gastroepiploic artery, are prepared for grafting by thoracoscopic or laparoscopic takedown techniques. Free grafts, such as a saphenous vein graft or a free arterial graft, can be used to augment the in situ arterial grafts. The graft vessels are anastomosed to the coronary arteries under direct visualization through a cardioscopic microscope inserted through an intercostal access port. Retraction instruments are provided to manipulate the heart within the closed chest of the patient to expose each of the coronary arteries for visualization and anastomosis. Disclosed are a tunneler and an articulated tunneling grasper for rerouting the graft vessels, and a finger-like retractor, a suction cup retractor, a snare retractor and a loop retractor for manipulating the heart. Also disclosed is a port-access topical cooling device for improving myocardial protection during the port-access CABG procedure. An alternate surgical approach using an anterior mediastinotomy is also described.